some difference of opinion as to whether the money subscribed should be invested for the purpose of endowing a lectureship or exclusively for the awarding of medals for original research. It was eventually agreed, however, hat two-thirds of the fund should be appropriated for lecture purposes and one-third for medal purposes, and it was likewise determined that the medal should bear the name of the "Graham" Medal; and that one triennial lecture should also be designated the "Graham" Lecture, both lectureship and medal being instituted in commemoration of the eminent services of a former citizen of Glasgow and member of the Philosophical Society, the late Thomas Graham, Master of the Mint, so distinguished for his researches in chemistry and physics.

As the scheme is now in such a complete state that it may be announced to the scientific world, we mention a few facts of interest in regard to it.

Through their president, Mr. James Mactear, of St. Rollox Chemical Works, the Council of the Chemical Section have been successful in obtaining from Her Majesty's Mint a valuable die of Prof. Graham, and the authorities of the Mint have agreed to strike the medal free of charge, the Trust Fund supplying the necessary gold for the purpose. The Council intend to award the medal at not less intervals than three years, in order that time may be allowed for papers to be brought forward of sufficient merit to justify them in making an award. It may be remarked that the medals, of not less value than 10*l.*, is to be awarded for the best original investigation in chemical physics or in pure or applied chemistry, which may be communicated to the Philosophical Society of Glasgow, or the Chemical Section thereof, during the three sessions preceding the award.[1] The Council of the Section will make the award, or it may be made by an equivalent body of local chemists of repute, with power on their part to remit the function to the Professor of Chemistry in University College, London, or to the Professor of Chemistry in the University of Edinburgh. Papers in competition for the "Graham" medal, may, we believe, be offered from any part of the United Kingdom; in other words, authors need not necessarily be members of the Philosophical Society of Glasgow, or of its Chemical Section. Dr. William Ramsay, University Laboratory, Glasgow, the present Secretary of the Section, will be glad to answer all inquiries in regard to the matter.

For the purpose of inaugurating the "Graham" lecture scheme in the most fitting manner possible, the Council of the Section have induced Mr. W. Chandler Roberts, F.R.S., the successor to Prof. Graham, as Chemist to the Mint, and for a long time his chief assistant in carrying out his later investigations, to deliver the first lecture, which is announced for Wednesday, the 22nd inst. Of course it is to be delivered in Glasgow. The subject is to be "Molecular Mobility, or some Forms of Invisible Motion," with special reference, doubtless, to the valuable physico-chemical researches instituted by Graham. It is the intention of the lecturer to exhibit and even to use a good deal of the apparatus employed by Graham, and now the property of Mr. Roberts.

"The fitness of things" in connection with the delivery of the inaugural "Graham" lecture is still further shown in the choice and consent of Mr. James Young, F.R.S., of Kelly, to preside on the occasion. There may be many readers of NATURE to whom it is not known that the gentleman just named was, when a very young man, a student in the evening popular classes conducted by Graham in the Mechanics' Institution and Anderson's College, Glasgow, whom he afterwards faithfully served as lecture assistant, first in Glasgow, and then in the laboratory of St. Thomas's Hospital, London. That he benefited by the scientific teachings of his great master is abundantly evident in the fact that he is himself the founder of one of our greatest chemical industries, namely, the manufacture of paraffin and paraffin oils—in a sense, the creation of the last quarter of a century, but already big with scientific and practical results. His devout respect for Graham's memory has since become almost a passion, and it is but proper that he should "assist" at this further effort to commemorate the great scientific triumphs of his teacher, master, and friend.

JOHN MAYER

NOTES

AT the anniversary meeting of the Imperial Academy of Sciences of St. Petersburg, on December 29, 1878, it was announced that Mr. Hind, F.R.S., superintendent of the *Nautical Almanac*, had been elected a Corresponding Member of the Academy. Besides Mr. Hind there are in the list of Corresponding Members of this great Academy the names of Airy, Darwin, De la Rue, Frankland, Hooker, Huxley, Miller, Owen, Sabine, and Sylvester.

WE trust the subject discussed in our first article this week will meet with the attention it deserves in the proper quarter. It is clear that, by almost every civilised government but our own, the vast importance of meteorological observatories at high altitudes is recognised, and the universal value of weather forecasts is now taken as a matter of course. France has her Pic du Midi and Puy de Dôme, America her magnificently-appointed Pike's Peak, and, as our article shows, other countries in Europe have each one or more of these all-important lofty observatories; but, as usual, we are half-a-century behind. How valuable meteorological observations would be to the nation, on one or more of our loftiest Scotch mountains, any meteorologist can tell, and may be seen clearly enough from the article. We earnestly hope the question will not be allowed to subside, but will be persistently urged in the proper quarter as a matter of national importance. It would not take the price of a new gun to found such an institution as is wanted.

THE telegraph wires of Pic du Midi Observatory have been broken again for a number of days. Some anxiety was felt at Toulouse for the safety of General Nansouty, and a rumour spread that the house had been crushed by an avalanche descending from the rock at the foot of which it has been built for protection against the wind. M. Albert Tissandier was sent to reconnoitre with three mountain guides. On January 9, in the morning, he started from Bagnères. On the 10th, in the evening, he arrived at the observatory, where he found that the rumours spread in the plains were unfounded; General Nansouty was taking his readings. On the following morning M. Tissandier took some drawings, and on the 12th he returned to Bagnères. The telegraphic communications with Puy de Dôme were interrupted on the 11th, at the very time when they were restored with Pic du Midi.

A SUCCESSFUL experiment was made the other night at Liverpool Street station in electric lighting, the particular form used being that known as the "Farmer-Wallace." Several platforms were successfully lighted up, and only one or two minor and easily remediable drawbacks characterised the display. By means of a small electro-magnet on the top of the frame, carrying a clutch, the carbons are kept constantly adjusted, without interference. The gas companies have at last determined to show what they can really do in the way of illumination, and give themselves fair play in any comparison with electric lighting. The Phœnix Company, on Saturday night, lit up a part of Waterloo Bridge Road with gas of increased power, on an increased number of lamps, with special burners, in specially-arranged cages. The result was quite sufficient to cause discontent with the present inadequate illuminating power of gas in street-lamps. The expense is of course greater, but we doubt if it would be so much as the cost of any satisfactory system of electric lighting; and perhaps, rather than run the risk of being relegated to the category of "lights of other days," the companies may, by a little pressure, be made to see the advisability of supplying better gas at even a cheaper rate than the present.

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[1] This is surely a mistake; why any limit?—ED. NATURE.

A NUMBER of friends and colleagues of the late Karl von Littrow, director of the Vienna Observatory, have had a medal struck in his memory, which may be obtained at a moderate cost from the publishing firm of Gerold and Co., Vienna. The face of the medal bears a portrait of von Littrow, and the reverse a view of the new Vienna Observatory.

M. DELESSE has been nominated a member of the Paris Academy of Sciences, in the section of Mineralogy, in place of the late Prof. Delafosse.

M. EDMOND BECQUEREL, who has been appointed vice-president of the Academy of Sciences for 1879, will act as president of the Academy in 1880, according to the constant custom. The president for 1879 is M. Daubrée, the celebrated geologist, who was nominated vice-president last year. M. Daubrée has been nominated president of the Central Section of the Geographical Society of Paris for 1879; M. Delesse, the newly-elected member of the Institute, one of the vice-presidents.

OUR readers will regret to hear that Prof. Clifford's health is still extremely delicate; he sailed for Madeira a few days ago, accompanied by Mrs. Clifford, in the hope that the genial climate would lead to improvement. We trust this hope will be realised.

THE Managers of the Royal Institution of Great Britain have decided that the next Actonian Prize shall be awarded to an essay illustrative of the wisdom and beneficence of the Almighty; the subject being "The Structure and Functions of the Retina in all Classes of Animals, viewed in relation with the Theory of Evolution." The prize is 100 guineas, and will be awarded or withheld as the managers shall think proper. Competitors for the prize are requested to send their essays (with or without their names being affixed) to the Royal Institution, addressed to the Secretary, on or before October 1, 1879. The adjudication will be made by the managers in 1879.

THE widow of Faraday died last Monday week.

IT seems to be acknowledged that the readings taken by the electrical instruments kept at Montsouris Observatory are not sufficient to give an accurate idea of the changes in the tension of the air. During the present period, when almost every fall of snow was observed during the night, the readings of the Montsouris Observatory gave no sign of negative tension. We are in a position to state that a self-registering apparatus would have been kept in operation from the beginning of last year, if it had not been required to send it to the Champ de Mars Exhibition for the instruction of visitors. M. Marie Davy is now engaged in putting into operation this apparatus. It should be stated that in 1873 a scientific delegate having been sent to England by M. Jules Simon, then Minister of Public Instruction, suggested that the self-registering instruments to be established in the French observatories, should be constructed according to the pattern adopted at Kew Observatory, so that comparisons should not be rendered impossible. The remarkable conclusions recorded by Mr. Whipple last week are an indication of the soundness of these suggestions.

THE winter has been so severe in France that the whole of the land on January 11 was transformed into a solid mass of ice, communication by rail, and even intelligence by wire becoming very difficult in the elevated parts of the country. The most extraordinary fall of snow recorded in the period was close to Montargis, where it accumulated to a height of 2 metres on a long narrow band of several kilometres long. In the meanwhile the largest rivers of the land overflowed, owing to the great rains which had been prevailing. The Seine reached an altitude of 6·21 metres at Pont Royal, the Loire was higher than on any year on record at Nantes, where the inundation was a public calamity; the increase of the Garonne and Rhône was only stopped by the freezing of the high lands.

AMONG the papers to be read at the forthcoming meetings of the Society of Arts are the following:—February 26, "Indian Pottery at the Paris Exhibition," by George Birdwood, M.D., C.S.I.; March 5, "The Social Necessity for Popular and Practical Teaching of Sanitary Science," by Joseph J. Pope, M.R.C.S.; March 12, "The Compensation of Time-keepers," by Edward Rigg, M.A.; March 19, "Economical Gardens for Londoners," by W. Mattieu Williams, F.C.S.; March 26, "The Treatment of Iron to Prevent Corrosion" (a second communication), by Prof. Barff, M.A. In the Chemical Section—January 30, "Gas Illumination," by Dr. William Wallace, F.R.S.E. In the Indian Section—January 21, "Quest and Early European Settlement of India," by George Birdwood, M.D., C.S.I.; February 21, "The Trade of Central Asia," by Trelawney Saunders. In the African Section—February 4, "The Opening of the District to the North of Lake Nyassa, with Notes of a Recent Expedition through that country," by H. B. Cotterell; March 18, "Some Remarks upon an Old Map of Africa contained in Janson's Atlas, published at Paris in 1612," by R. Ward; April 1, "The Contact of Civilisation and Barbarism in Africa, Past and Present," by Edward Hutchinson. Cantor Lectures—First Course, on "Mathematical Instruments," by Mr. W. Mattieu Williams. The Second Course will be by Dr. W. H. Corfield, M.A., on "Household Sanitary Arrangements;" it will consist of six lectures, to commence on February 17. The Third Course will be by Mr. W. H. Preece, on "Recent Advances in Telegraphy." A course of two lectures will be given by Dr. B. W. Richardson, M.A., LL.D., F.R.S., on "Some Further Researches in Putrefactive Changes," in continuation and completion of his course of Cantor Lectures given last session.

A NEW application of the electric light has just been made by some German River Steamboat Companies. Experiments made on the steamers plying on the Weser and Elbe Rivers having proved perfectly successful these steamers will henceforth be illuminated by electricity.

THE captain of the steamboat *Chillon*, the Geneva correspondent of the *Times* writes, which was caught in the storm on the morning of January 2, describes in a letter to the local papers a scene which is not witnessed once in a generation. On Lake Leman, between Rivaz and St. Gindolph, the two winds the *föhn* and the *bise*, met twisting the water up into a column nearly 40 feet high and 10 yards in circumference. It was a veritable waterspout, and, after retaining its position for several minutes, took the form of a vapoury cloud and melted away. The meeting of the *föhn* and the *bise* is more common on the Lake of Lucerne than that of Geneva; but wherever it happens it is terribly destructive, sweeping down the tallest forest trees and wrecking every craft smaller than a steamer.

A SLIGHT shock of earthquake was felt on Friday last at 3 A.M. at Cologne and Eschweiler. From Buir two shocks are reported —the one at 3.15 and the other at 7.43. The *Neue Freie Presse* announces a considerable shock of earthquake from Unterdranburg, which occurred on the 11th inst., at 10.8 A.M. The Central Observatory at Vienna reports a powerful shock at 10h. 18m. 15s. on the same day observed at Klagenfurt. It lasted thirteen seconds, and was followed by three slighter shocks. The direction was from south-east to north-west. A report from Eisenkappel gives the same time. The shock observed at Cologne, it will be remarked, occurred on the 10th inst., a day sooner.

Invalids will be glad to learn that, amidst the severe weather, a comparatively mild climate exists in a part of their own country. A bouquet arrived from Glengariff on Saturday, the 11th instant, comprising wallflower, primrose, primula, stocks, chrysanthemum, scarlet geranium, arbutus-berries, and a rose-bud, all picked from an exposed garden. In Madeira—but five days' journey—ripe bananas and custard-apples are hanging on the trees. Many of the gayest flowers are in full bloom.

It is proposed at the next meeting of Russian naturalists to unite all Russian scientific societies into one large association, with zoological, botanical, and physiological sections which would have branches at all the Universities.

The admirable work by Mr. William H. Edwards on the "Butterflies of North America" has been continued by the publication of the seventh part of the second series, which, like its predecessors, is illustrated by five quarto plates of interesting species, drawn by Miss Mary Peart, of Philadelphia. It is especially interesting from the number of observations made by the author, and his correspondence upon dimorphism and polymorphism of a number of the lepidoptera.

We cannot help expressing our regret at the almost total destruction of the Birmingham Central Reference Library, with its irreplaceable special collections. We have had frequent occasion to speak of the reports of the Birmingham system of libraries, one of the best anywhere. The building which has suffered disaster was close by the Midland Institute, which fortunately has escaped.

During the past summer discoveries of a very interesting series of fossil forests were made by William H. Holmes, of the Hayden (U.S.) Geological Survey. The fact of the occurrence of abundant fossil wood, and in some places of fossil trunks *in situ*, had been noted by former visitors to the Yellowstone Park, but nothing had been learned of the manner in which the forests had been preserved, neither had their great extent been suspected. It is found that an extensive series of forests have been buried in the sedimentary formations of the volcanic tertiary, especially in the region drained by the East Fork of the Yellowstone. From the bottom to the top of the highest cliffs rows of upright trunks may be seen, weathered out and ranged along the ledges like the columns of a temple. Throughout a long period of subsidence a constant alternation of land and sea seems to have been kept up by the irregular deposition of fragmentary volcanic products, so that numberless forests grew and sank, one after another, beneath the sea. Fully 4,000 feet of the tree-bearing strata were formed before the final upward movement began. These same strata now cap some of the highest ranges of the Rocky Mountains, and cover an area of upward of 10,000 square miles. The silicified trunks are in many cases from twenty to thirty feet high, and fairly rival the giant trees of California in dimensions.

In the *Colonies and India* we find a note respecting the employment of sheep as beasts of burden. In Eastern Turkistan and Thibet, for instance, borax is borne on the backs of sheep over the mountains to Leh, Kangra, and Rampur on the Sutlej. Borax is found at Rudok, in Changthan, of such excellent quality that only 25 per cent. is lost in the process of refining. The Rudok borax is carried on sheep to Rampur, which travel at the rate of two miles a day; but, notwithstanding the superior quality and the demand for it in Europe, the expenses attending its transport seriously hamper the trade, which, but for the sheep, would hardly exist at all.

The proportions of some principal constituents of sea-water have recently been determined by Herr Jacobsen, from forty-six samples of water taken from the most different regions and at different depths, during the expedition of the *Gazelle*. With regard to carbonate of lime, he obtains an average of 0·269 parts of it in 10,000 parts of sea-water; the minimum was 0·220 parts, and the maximum 0·312 parts. Such differences he attributes mainly to experimental errors, and draws the simple conclusion (not favourable to some interesting biological and geological speculations) that the proportion of carbonate of lime in sea-water varies but slightly. The influence of extensive separation of the carbonate of lime by organisms and that of extensive local replenishing of the water with the carbonate are speedily equalised by ocean currents and obliterated for analysis. One region of the ocean does not afford better life conditions for lime-secreting animals than another (by containing more carbonate of lime), and among the causes from which most of such animals are found on coasts and at comparatively small depths is not to be reckoned that adduced by J. Davy, that in the open sea the carbonate almost wholly disappears. Nor is there ground for Forchhammer's supposition that those animals must be capable of changing the sulphate of lime into the carbonate. The author found but little variations also in the proportions of chlorine and sulphuric acid (the chlorine was somewhat the more constant). The observations in general point to a rapid mixture of the sea-water of different regions by currents both horizontal and vertical.

A recent number of *La Nature* gives the following statistics of education in Germany and France:—Of the 86,177 conscripts enrolled in 1877 in the German army 78,622 had received primary instruction in the German tongue, 5,415 in other tongues, and 2,140 or 2·483 per cent. could neither read nor write. The district of Posen furnished the largest contingent of this last category, 11·20 per cent.; then follow Prussia, Silesia, Pomerania, Westphalia, Hanover, Brandenburg, Sleswig-Holstein, the Rhine provinces, Hesse Nassau, and lastly Hohenzollern, of which all the conscripts had received primary instruction. According to the census of 1876 there are, in France, 4,502,894 children of six to thirteen years of age. The number of primary schools is about 71,547, of which 9,352 are absolutely gratuitous. It is reckoned that there are 624,743 children who do not attend any school.

The new railway bridge across the Lim fjord in the Danish province of Jütland was opened for traffic on December 15.

Herr Schaper, an eminent Berlin sculptor, has just finished the model for a bust of the late Prof. Braun, for many years director of the Berlin Botanical Gardens. The bust will be executed in bronze and will be erected in the gardens upon a granite pedestal of 2 metres height.

We have received parts 1 and 2 of vol. ii. of the *Transactions* of the Watford Natural History Society, containing several papers which show that the Society continues to do good work among the animals and plants of Hertfordshire.

The additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*) from India, presented by Mr. Wm. Trent; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. Carroll; a Common Marmoset (*Hapale jacchus*) from South-East Brazil, presented by Mrs. Currey; a Triangular Spotted Dove (*Columba guineæ*) from South Africa, presented by Col. F. C. Hassard, C.B.; a Great Eagle Owl (*Bubo maximus*), European, deposited; a Bar-winged Rail (*Rallina pœciloptera*) from the Fiji Islands, purchased.